

ABSTRACT OF THE DISCLOSURE

Non-contact methods for determining a parameter of an insulating film are provided. One method includes measuring at least two surface voltages of the insulating
5 film. The surface voltages are measured after different charge depositions. Measuring the surface voltages is performed in two or more sequences. The method also includes determining individual parameters for the two or more sequences from the surface voltages and the charge depositions. In addition, the method includes determining the parameter of the insulating film as an average of the individual parameters. The
10 parameter is substantially independent of leakage in the insulating film. Another method includes determining a characteristic of nitrogen in an insulating film using two parameters of the insulating film selected from equivalent oxide thickness, optical thickness, and a measure of leakage through the insulating film. The characteristic may be a nitrogen dose, a nitrogen percentage, or a presence of nitrogen in the insulating film.

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